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AUGUST 5.

The President, Dr. RUSCHENBERGER, in the chair.

Ten members present.

AUGUST 12.

The President, Dr. RUSCHENBERGER, in the chair.

Six members present.

AUGUST 19.

The President, Dr. RUSCHENBERGER, in the chair.

Fourteen members present.

The death of Elias Durand and Dr. L. S. Bolles was announced.

The Composition of Trautwinite. By E. GOLDSMITH.—The very small quantity of the substance I had for the first examination of the above-named mineral (see Proceedings of the Academy, Jan. 1, 1873) caused me to overlook a few important elements, namely, silica and lime.

John C. Trautwine, to whom my thanks are due for procuring more of the substance, has ascertained that the locality of it is Monterey County, California. The mechanical separation of the Trautwinite from the chromite is a difficult and tedious operation; however, I succeeded so far, that with the lens no black particles of chromite could be discerned.

As the substance is insoluble in acids, I brought it into the soluble condition by fusing it in a mixture of carbonate of soda and saltpetre, treating the fused mass with water until all the soluble parts were exhausted, and the insoluble part with hydrochloric acid. What the acid had not dissolved was again fused with soda and saltpetre, and the obtained mass treated the same as before. From the alkaline solution, after acidulation and reducing the chromic acid to sesquichloride of chromium by hydrochloric acid and alcohol, I separated first silica, then the sesquioxide of chromium.

The other solution, containing the bases as chlorides, was evaporated to dryness, moistened with hydrochloric acid, water added, and thus I found another small quantity of silica. The alumina and iron were then separated from the lime and magnesia by ammonia; but the iron and alumina were again dissolved and

precipitated as before to insure a perfect separation from the lime and magnesia. From the mixed liquor containing the alkaline earths the lime was removed as oxalate; the magnesia finally—after expelling the ammoniacal salts—as ammonio-magnesia phosphate. The iron and alumina were separated by caustic potassa. The iron also in this case was redissolved, and again thrown down with an excess of caustic potassa to render the separation of the alumina as complete as possible. After carefully washing the iron, etc., the alumina was separated from the alkali in the usual way.

The result of the analysis is as follows:—

Silica	(Si) = 21.78 %.
Sesquioxide of chromium	(Cr) = 38.39 “
“ iron	(Fe) = 13.29 “
“ aluminum	(Al) = .81 “
Lime	(Ca) = 18.58 “
Magnesia	(Mg) = 7.88 “
Loss on ignition	= .11 “
	<hr/> 100.84

By comparison between the silica and the other oxides, I found the ratio to be as 1 : 2.4 nearly; that is, when the sesquioxides and the monoxides are added together in their respective equivalent quotients. But if the quotients of the added sesquioxides and the quotients of the added monoxides are compared with the equivalent quotient of the silica, then the ratio of the silica to the sesquioxides and to the monoxides is as 1 : .9 : 1.4.

These figures could be used for a complicated formula, which, however, I omit, because it would not give any more correct idea of the combination.

Finally, I am aware that this mineral has been erroneously called ouvarovite, which, as is well known, is a variety of garnet.

To show the difference in the composition of the two minerals I give the results of O. L. Erdman's analysis of ouvarovite and the composition of the new species Trautwinite:—

	Si.	Al.	Fe.	Cr.	Mg.	Ca.
Ouvarovite,	36.93	5.68	1.96	21.84	1.54	31.63
Trautwinite,	21.78	0.81	13.29	38.39	7.88	18.58

That these minerals are widely different from each other is readily seen in the two lines of figures; besides this we have also the difference of form, garnet being isometric and Trautwinite hexagonal. I endeavored repeatedly to project upon paper, through the camera lucida, points for measuring angles of the new mineral, but the results varied so much among themselves that they were not fit for publication.